montana OUT DOORS

JANUARY/FEBRUARY 1971

EMPHASIS . . . Montana's environment

montana OUTDOORS

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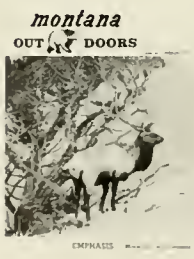

THE COVER

Big game species such as the elk and mountain goat are two of Montana's best environmental indicators. A livable environment for the elk and goat makes a quality environment for Montanans. The front cover photo was taken by Dick Ellis. The mountain goat on the back cover was captured by the camera of Otis Robbins.

Vol. 2, No. 1 January/February 1971

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THE OFFICIAL PUBLICATION OF THE MONTANA FISH AND GAME DEPARTMENT

Keep your outdoor IQ up with a subscription to MONTANA OUTDOORS

MONTANA OUTDOORS is not just another hunting and fishing magazine. Future issues will contain a wide variety of material on many different forms of outdoor recreation and on popular topics concerning the sound management of our fish and game and, as this issue exemplifies, the wise use of Montana's abundant natural resources.

Even though we've dressed our official publication up a little, we're not trying to compete with popular commercial magazines. Commercial advertising will never find its way into MONTANA OUTDOORS and you won't find it on the newsstands. This publication will be distributed strictly on a subscription basis.

MONTANA OUTDOORS is a conservation-oriented magazine designed to inform our readers about popular topics concerning outdoor recreation, wildlife management and the environment—**not** to make money for the Fish and Game Commission.

This issue and the next two issues will be distributed free of charge to everyone on our mailing list. However, the commission will start charging for its official publication on July 1, 1971. An annual fee of $2.00 per year or $5.00 for three years will be used to cover some of the costs involved in putting out the magazine. This small subscription charge will by no means pay for the magazine, but it will help pay for part of the high cost of printing.

Everyone who is presently on our mailing list will continue to receive MONTANA OUTDOORS through the May/June issue. At that time, we'll convert to the paid subscription policy and abandon the old mailing list. The commission will stop issuing free subscriptions on March 1, 1971.

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THIS SUBSCRIPTION BEGINS JULY 1, 1971

THE FUNDAMENTALS

Knowledge of the terms ecology and environment is a prerequisite for any discussion involving environmental conservation.

by Steve Bayless

With today's public outcry over environmental damage, how many times have you heard someone say, "That's bad for the environment," or, "The ecology of the area will be ruined if such and such is done." Do you know what they're talking about? Do they? What is "ecology" and "environment?" Why all the concern in the first place?

Mankind is beginning to worry about the durability of the small globe that carries him through space. At last he has admitted that the earth is finite—its resources won't last forever, its air and water can become irreparably polluted, its plants and animals can disappear. Man has come to the realization that he cannot continue to abuse his environment and exist. Thus "environment" and "ecology" are becoming the unavoidable concern of everyone.

Although everyone agrees that fish need water to survive, a stream must have more than water to support a healthy fish population. It needs bank vegetation, pools, riffles, an adequate food supply, escape cover, facilities for reproduction and the correct water temperature.

But like so many popular ideas, they are used and repeated with little genuine understanding. Maybe it's time to back up and review some basic ideas and facts.

The environment, according to the dictionary, is the combination of external conditions that affect the growth and development of an organism. Man's environment is the atmosphere of the earth with all its changing conditions, the oceans and land, and all the plants and animals.

A fourth grader once said it better than anyone: "The environment is everything that isn't me."

The **interrelationship** between living organisms and their environment is called the ecology of the environment. Ecologists study these relationships to learn how and why living things exist in a given area. Studies of the ecology of an environment give man a better idea of the effects any change in the environment will have on the plants and animals of the region, and ultimately on man.

Every organism has a specific environment to which it is best suited. A fish needs a water environment and an earthworm needs soil, for instance. Ecology means the **relation** of the fish to its environment——factors such as availability of food, competition, predators, escape cover, facilities for reproduction, water temperature, structural features in the aquatic habitat such as deep holes, bank vegetation and riffle areas.

EDITOR'S NOTE—Steve R. Bayless, 30, received a Bachelor of Science degree in wildlife management from Utah State University, Logan, in 1962, and a Master of Science degree in game management from Montana State University, Bozeman, in 1967. He is now the Fish & Game Department District Information Officer in Glasgow. Before taking this position he was a game management biologist in Havre and an information assistant in the Information and Education Division in Helena.

A LIVABLE ENVIRONMENT FOR WILDLIFE IS A QUALITY ENVIRONMENT FOR MAN A LI

The ecologist must have a wide grasp of knowledge in many fields. He must know the biology of the animal he works with as well as the essential features of that animal's habitat. Zoology, botany, physiology, entomology, genetics and meteorology are just a few of the sciences which contribute to the study of ecology.

When just one aspect of a particular environment is changed, the whole ecological picture may be radically altered. The sage grouse is a perfect example of an organism so closely tied to its habitat that it cannot live in areas where the habitat does not meet its specific needs. The destruction of large areas of sagebrush by herbicide sprays has drastically reduced the population of sage grouse in certain areas. Sage grouse use sagebrush for cover, for food, for nesting, for mating and for just about all the rest of their activities. For 20 years the Fish and Game Department has battled with various federal agencies over the destruction of sagebrush on public lands, destruction which is justified on the basis of producing increased livestock forage.

The battle is still raging, along with many others that have come to the public's attention. An important issue is the fight to save Montana's rivers and streams from pollution. The Yellowstone and Missouri resemble cesspools in places, and the list of filthy waters in the state is getting longer. In 1967, the present water pollution law was inadequate to stop pollution of the Clark's Fork River. The law has no teeth: there are conflicts of interest and confusing procedural provisions. If Montana is to retain her reputation for good fishing, her streams, rivers and lakes must be protected against depredation by industries, mining companies, municipalities and by agricultural pollution.

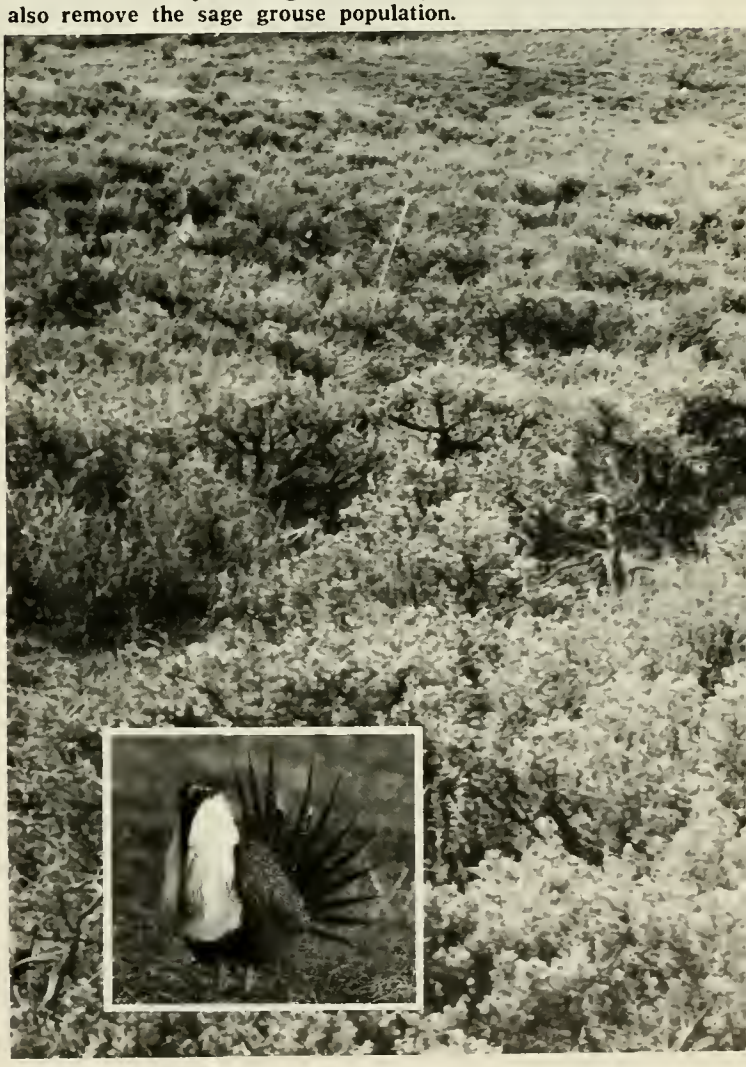
Another major threat to the ecology is pesticides. Man is just learning of some of the side effects of these chemicals. The herbicide 2,4,5-T, which is used for weed and sagebrush control, was found to cause birth defects in animals. DDT residue, which remains in the environment as long as 30 years, was shown to reduce the capacity of birds and fish to reproduce. It is blamed for the near extinction of the brown pelican, peregrine falcon, bald eagle and other predatory birds.

A few of Montana's other environmental problems include overzealous dam building, strip-mining and clear-cutting, air pollution, littering, mismanagement of public lands, oil wells and thermal pollution.

Montana is in the early stages of a critical fight to keep her environment safe and to preserve her ecological balance. This does not mean the end of all industry, all development, all pesticides. It means that orderly development with safeguards to protect the environment is needed; it means that there must be management that considers the future as well as the present.

"Ecology" and "environment" are ideas to use as a step towards action—action such as talking to people and writing to public officials demanding tangible results in the environmental battle. They are more than words—they are the key to the quality of our future.

Sage grouse know how important an environment can be. This highly-acclaimed game bird is almost totally dependent on an environment containing sagebrush. When herbicides destroy the sagebrush, they also remove the sage grouse population.



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The scenic Beartooth Mountains (F&G photo by Tony Wastcoat)

Beartooth Besieged

Will the beautiful Beartooth Mountains of south central Montana be the next to fall before the onslaught of mining companies armed with bulldozers, drilling rigs and antique mining laws?

by Tony Wastcoat

"Marginal mining may materialize in magnificent Montana. Magnetized, motorized machinery manipulating more majestic mountains make many Montanans morose."

This caption appeared under a photograph in a 1969 issue of **Montana Environmentalist** (then the **Montana Wildlife Federation News**). It referred in part to mining of the Beartooth Mountains in south central Montana. Perhaps the one "M" that could be challenged is the "marginal," since all indications, including statements by

mining company officials, point to one of the richest mineral discoveries in years.

The Beartooth Mountains tower up to spectacular Granite Peak, which at 12,799 feet is the highest point in Montana. From the snowfields and glaciers of the range come the clear, cold waters for a multitude of scenic lakes and streams. Cutthroat, rainbow, brown, brook and golden trout are found in these waters. Elk, summering mule deer and moose feed in the mountain valleys. The peaks and plateaus are the home of mountain goats and bighorn sheep.

Now more than 100 square miles of this country are in danger of total ecological disruption. Mountain meadows and ridges, the East and West Rosebud Rivers, the Stillwater and the West Fork of the Stillwater River, the East Boulder and the Main Boulder Rivers—ALL are being damaged by the extensive mineral exploration in progress, and ALL are apt to be damaged by the mining activity which is apparently inevitable.

THE HISTORY

The presence of chromite and other valuable minerals in the area has been known since the late 1880's. In 1917 and 1918 a portion of the area was actively explored, and during World War II chrome was produced in two areas. In the early 1960's there was some short-lived exploration, but not until 1967 did the rush begin. Numerous individuals representing themselves or companies invaded the mountains in search of nickel, copper and other minerals. The ensuing years have seen increased activity dominated by four corporations, and several others indicate that there will be competition for the minerals.

THE PROBLEM

Several aspects of exploration and mining have a direct bearing on the welfare of wildlife. Game animals such as elk face habitat destruction from both mining and road construction. Elk and certain other species of big game are intolerant of intensive activity by man and the disturbance from mining and improved access may force them from the area.

Water pollution has occurred and will continue to occur in the exploratory area. Erosion caused by destruction of the fragile vegetation will cause the siltation of at least six productive trout streams. Other potential pollution includes a change in acidity, heavy metal toxicity, dewatering and changes in water temperatures.

Aside from the fact that mining itself has a serious and lasting effect on the environment, mining laws—both federal and state—are aggravating the situation. If it is assumed that mining in the Beartooth Range is necessary for Montana's economy and for the welfare of the nation, then the mining laws must be enforced. If they are not there may be no elk or cutthroat, no sheep or goldens, no goats or rainbows, no moose or browns, and no deer or brookies.

The following article by Stewart Udall appeared in the **National Wildlife** magazine. It is based upon mining activity in Idaho which is similar to the Beartooth operations. The White Clouds Mountains have the same fish species, the same big game species and the same problem as the Beartooth Mountains—antiquated mining laws.

THE MINING LAW OF 1872 MUST BE SCRAPPED

by Stewart L. Udall

(**National Wildlife,** June-July 1970: reprinted with permission)

The White Clouds (Idaho) situation is by no means an isolated example of how an antiquated law allows miners to misuse our public lands. It is really a microcosm of what has been happening across America for decades.

In the past, the myth of endless resources blinded us to the horrible results of reckless mining practices on our public lands. But times have changed and we realize now that we dare not destroy the few White Clouds which remain. The scars are far too deep. Our mountains have been stripped and gouged by copper miners in Arizona and Montana, by iron ore miners in Minnesota, by jade miners in Wyoming and coal stripping in Appalachia . . . all in the name of "progress." Some of this mining was vital to national growth . . . but far too much of it was carried out under

A bulldozer's trail looms like a monster's track on the fragile mountain landscape. (F&G photo by Tony Wastcoat)

a strip-and-run philosophy, needlessly reducing the quality of everyone's environment.

The real culprit at White Clouds is not the mining companies nor the United States Forest Service, nor the people trying to save the beauty of these majestic peaks. What is really wrong is the antique mining law of 1872, a frontier law that protects the exploiter and ignores the values of scenery, wildlife, watershed and recreation. **THE LAW NO LONGER SERVES THE PUBLIC INTEREST. WE NEED NEW LAWS THAT WILL.**

Five days before leaving the office of the Secretary of the Interior in January, 1969, I wrote in a letter to members of the Public Land Law Review Commission: "After eight years in this office, I have come to the conclusion that the most important piece of unfinished business on the nation's natural resource agenda is the complete replacement of the mining law of 1872.

"Put simply, this obsolete and outdated statute inhibits the best kind of multiple-use management. It operates as an outright giveaway of vital natural resources," I concluded.

The problem began in 1849 with the cry of gold. This magic word, with its hypnotic effect, lured thousands to the mining fields of the West.

Conditions in the camps were chaotic at first, but crude, common sense rules were adopted and were spread from mining district to mining district. They soon had the force of frontier law and eventually were adopted as the American common law governing western mining activity.

For almost 20 years Congress refused to act upon this strange state of affairs and, to some extent, state governments assumed control of the mining. In 1866, Congress finally faced up to the chaotic conditions which had developed from the lack of federal mining legislation.

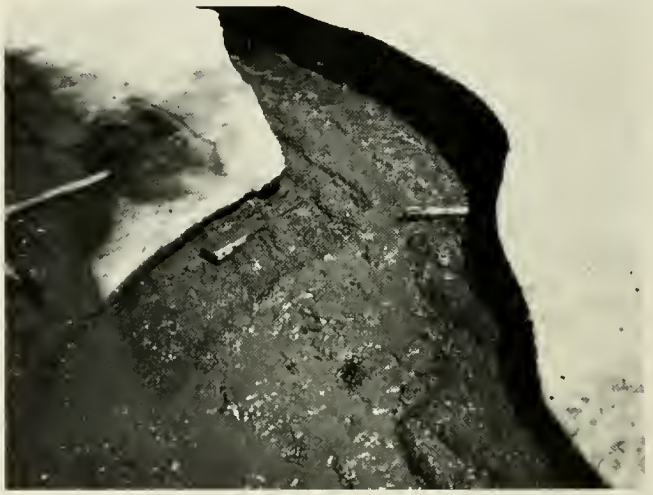
But the local customs, rules and regulations of miners had become so firmly entrenched that it was politically impossible to alter them. This policy—essentially a system of free mineral lands as a reward for discovery—was reaffirmed in 1872 and today governs mining rights on public land.

Under the mining law of 1872 the discoverer of a valuable deposit (other than those minerals expressly covered by the leasing law and the materials act) can establish a legal claim to it merely by marking the boundaries of the claim and, if state law requires it, recording the location in the county office. No more is required. There is no provision for notifying the federal government of the existence, position or size of the claim or of the fact that minerals are being extracted. Having staked his claim, the miner may continue indefinitely to enjoy what amounts to almost total ownership of the property, mining it or not as he wishes. His only obligation is to make $100 worth of improvements on his location each year or risk being dispossessed by another claimant.

The mining law of 1872 places the miner in a unique position. He has all the rights but none of the responsibilities that being a landowner normally entails.

There is no limit to the number of claims a man can locate and hold. Some individuals and corporations have been involved in the location of more than a million acres of largely untested claims. Two summers ago I saw a vast area of scenic country in southern Utah gouged and "staked" by a Canadian uranium company on the assumption there was uranium hundreds of feet underground.

There is no practical way a miner can be prevented from prospecting, mining the mineral deposit and then moving on, leaving behind broken machinery, trash and mined holes.



A close-up of acid mine waste—this poison must be kept out of Montana's fishing waters. (F&G photo by Tony Wastcoat)

A situation similar to the White Clouds occurred in the Pike National Forest, Colorado, a couple of years ago. Mining dolomitic limestone by open pit methods has scarred the beauty of parts of the front range of the Rocky Mountains. A huge unsightly scar can be seen from a wide area, including the Garden of the Gods Park, and it spoils the once picturesque view of Pikes Peak.

The world's worst examples of strip mining, of course, are found in the East. Anyone who has

flown over the coal fields of Pennsylvania, Ohio, West Virginia and Kentucky can only be appalled by the devastation of whole sections of once beautiful forest lands. No war, no holocaust, could wreak such havoc as that which the strip miners have left in the once beautiful rolling green hills of Appalachia. These gigantic scars are a monument to man's total disregard for his environment.

Due to pressures from the mining lobby, passage of a good mining law will be very difficult. Conservationists will watch with particular interest the recommendations of the Public Land Law Review Commission this year. Though many commission members are "user" oriented, they may propose sweeping revisions which will consider the nation's state in uses of the public domain for the benefit of future generations.

Let us hope they recommend a mining law which will protect the land for wildlife, for food, for timber, for people . . . recreation, living space and scenery. Where mining is deemed practical and necessary, the laws should require the mining company to have a leasing arrangement with the federal government in which regulations can be used to protect public values and in which the people will share in the profits realized. And lastly, the law **must** require restoration of top soil and revegetation.

Until the slow wheels of government enact such a law, however, the short term stop-gap at places like White Clouds can be to deny construction of access roads on public lands if mining operations threaten the prime public values. The National Wildlife Federation believes laws to accomplish this are already on the books if they are properly interpreted and enforced.

* * * * *

Mr. Udall's article points out the changes needed in the federal law. Changes in Montana's law must accompany federal reform. One of Montana's mining laws requires that for each claim an individual must remove 150 cubic feet of material in order to validate the claim. This operation is often of little use to the miner, it destroys vegetative cover and it leaves a permanent scar. An alternative is the legalization of core drilling for discovery work. Core drilling would not leave as large a scar as a bulldozer path, a common sight in areas where the present law is enforced.

A fine catch of cutthroat trout—mining may be the demise of their offspring.

Montana law enforces the antiquated federal law requiring that $100 be spent annually on each claim to keep it valid. Apparently the easiest way to spend this money is to hire a bulldozer to run an additional trench through the claim. There is usually no thought of reclaiming these trenches.

In order to stress that the Montana Fish and Game Commission is **not against** mining but for **sane** development, the following are excerpts from the Montana Fish and Game Commission's "National Resources Development Policy," which was adopted January 13, 1970:

"The Montana Fish and Game Commission recognizes the nation's need for an expanded and continuing supply of natural resources and recognizes the economic opportunities associated with the development of these resources. The Fish and Game Commission also recognizes the variety of environmental and ecological problems that have in the past been associated with the extraction and development of Montana's natural resources. It is increasingly apparent that Montana is entering a period of greatly accelerated development. Therefore, the Fish and Game Commission adopts the policy of supporting the orderly and completely planned development of any natural resource-oriented industry that considers and respects all of an area's ecology and environmental quality.

" . . . To this end the Montana Fish and Game Commission will work cooperatively with any and all companies to insure that new developing mineral . . . extraction complexes are planned to have

EDITOR'S NOTE—O. Burton "Tony" Wastcoat, 31, was formerly the Fish & Game Department District Information Officer in Miles City and Billings. He is now attending the School of Law at the University of Montana, Missoula. He received a Bachelor of Science degree in wildlife management from the University at Missoula in 1962, and a Master of Science degree from Colorado State University, Fort Collins, in 1966.

the least possible disruption of an area's present fish and wildlife ecology, and that this development be designed to insure maintenance of the highest environmental quality technologically possible. Recognizing the complete lack of environmental protection now associated with present mineral . . . exploration and mining claim maintenance procedures, the Fish and Game Commission supports efforts to make mineral exploration . . . more compatible with environmental quality maintenance.

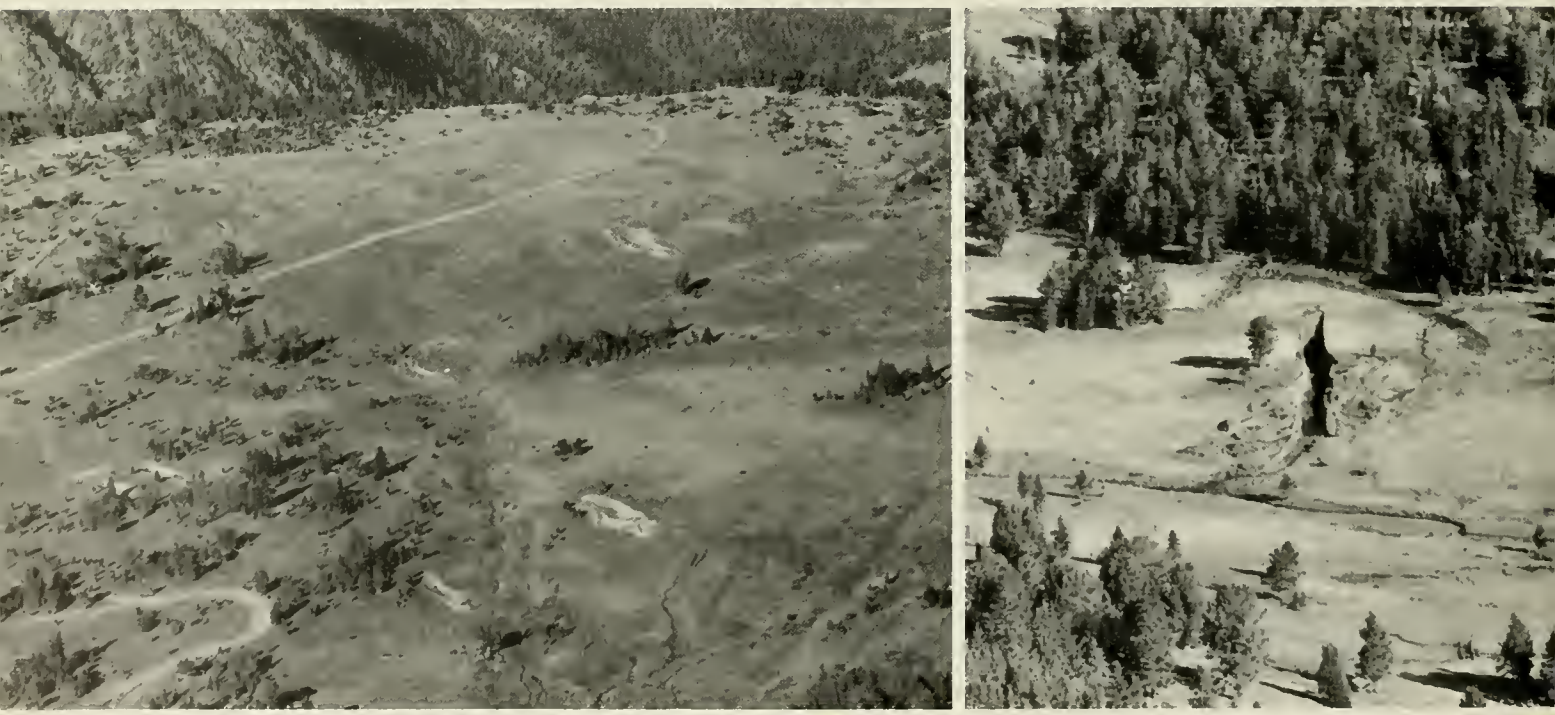
" . . . It is obvious that this involvement on the part of the Fish and Game Commission is essential to insure the stability of the habitat or the environments that produce our fish and wildlife resource. It is further apparent that this involvement is improbable within our present system of financing. Therefore, the commission urges the developers and extractors of Montana's natural resources to recognize their responsibility to the land that is the source of their products, and to those who would use them after us, and support this policy of cooperation both morally and financially . . . ."

As Mr. Udall pointed out, the disruption of our natural environment through antique mining laws is not unique to Idaho. We should also note that this disruption is not unique to the majestic Beartooth Mountains, nor to the Lincoln country, nor to any other portion of our state.

The following list, compiled by the Montana Bureau of Mines and Geology, indicates counties where mining operations have been allowed, under the present laws, to force scars onto the landscape. The authors of the list admit that it is incomplete. Beaverhead County has 30 such operations, Cascade 7, Broadwater 7, Blaine 1, Carbon 1, Deer Lodge 10, Fergus 9, Flathead 2, Gallatin 1, Granite 51, Jefferson 42, Judith Basin 3, Lewis and Clark 18, Liberty 1, Lincoln 7, Madison 27, Meagher 2, Mineral 8, Missoula 5, Park 2, Phillips 2, Powell 12, Ravalli 4, Sanders 9, Silver Bow 16, Sweet Grass 1, Stillwater 1 and Toole 1.

In addition to the operations in the above-mentioned counties, other types of mining and mining laws should be cause for concern. An article in the August, 1968, issue of the **Montana Wildlife Federation News** ("Montana—A Future Appalachia?") pointed out that Montanans must examine the weak strip mining reclamation laws for coal, and also must be aware of the absence of reclamation laws for other mining operations.

MONTANANS—it is your choice. Do you want our mining laws modernized? The future of the Beartooth Mountains, and the rest of Montana, depends on you.



Mining claims and road construction scar what was once a scenic landscape in many areas of the Beartooth Range. (F&G photo by Tony Wastcoat)

ILDLIFE IS A QUALITY ENVIRONMENT FOR MAN A LIVABLE ENVIRONMENT FOR WIL

NEW CHIEF

The Fish and Game Department's Information and Education Division has a new chief. He is H. Max Stone, 43, former District Supervisor in Miles City. He replaces Richard J. Munro, who has accepted a position with the National Park Service.

Mr. Stone is no newcomer to the Information and Education Division. He transferred from the Fur Division (no longer in existence) in 1960, two years after he joined the department. He served as District Information Officer in Glasgow, Great Falls, Kalispell and Billings, then was appointed District Supervisor in Miles City four years ago.

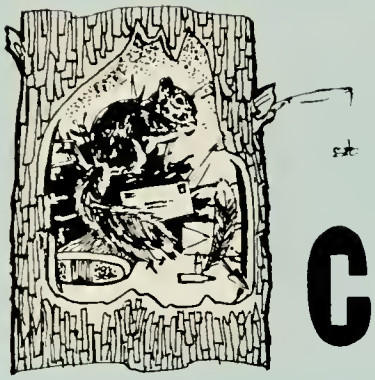
Mr. Stone came to Montana from Manhattan, Kansas, where he was District Game Manager for the Kansas Forestry, Fish and Game Commission. Prior to that, he was graduated from Kansas State University at Manhattan in 1951 with Bachelor of Science degrees in zoology and education. He served with the United States Navy in World War II.

Mr. Stone assumed his new position in mid-November. He will be joined by his wife, Nancy, and three of his four children—Terri, 15, Mike, 17, and Marla, 20——at the end of the school year in June. His oldest daughter, Karen, is married and living in Ogden, Utah. She has one son, Jay, age one year.

Radio Programs

Montana sportsmen can also "listen" to MONTANA OUTDOORS.

Five-minute programs, entitled "Montana Outdoors," can be heard weekly on most radio stations throughout the state. The programs cover popular topics concerning wildlife management and are broadcast as a public service of the radio station and the Information and Education Division of the Montana Fish and Game Department.



THE CatchALL

THE HARD WAY

The court system in Maine may have the answer to the litter problem. Recently one judge levied a $20 fine against a resident for defacing the environment with one soda pop bottle. This is not the first instance of a litterbug paying for his work, but this one has an unusual catch to it. The litterbug had to pay his fine by gathering up returnable bottles along the highway and cashing them in until he made enough money to pay his fine. At two cents apiece, he had to collect 1,000 bottles to pay the $20 fine.

Billboards Forever

Have you stopped to wonder lately why our highways are still lined with ugly billboards even though they have been illegal since 1965?

The reason falls into the old stand-by category—lack of money. The Highway Beautification Act made billboards illegal, but it also provided that each state shall determine the value of each sign (one at a time) and compensate the owner when it is removed.

The Department of Transportation says that of the 800,000 illegal billboards, only 324 have been removed since the law was enacted in 1965. At this rate the Department of Transportation will be in the billboard removal business for 11,000 years.

However, there are some indications that this dilemma could be corrected in the near future. At the present, a bill is fighting its way through Congress which, if enacted, will revamp certain federal funds to pay off the sign owners and make the owners remove the billboards themselves.

DEVELOPMENT

On a nation-wide basis, at least 3000 acres of land are being developed each **day**, adding up to more than a million acres each year. How long can this last?

We're glad you like it.

We could hardly publish our second issue without a sincere "thank you" for the hundreds of complimentary letters we've received concerning our new magazine. We'll pick out a few for a "Letters to the Editor" page that we will be starting in the March/April issue.

Almost every letter asks for information concerning our paid subscription policy. We've settled on a $2.00 a year subscription charge so now we can start accepting your checks. More detailed information dealing with subscriptions and a convenient coupon can be found on the first page of this issue.

Many letter-writers asked to be put on our paid subscription list. Well, we're just starting it now, so to be sure you will receive the July/August issue, send in the coupon found on the first page with your subscription charge.

We must apologize for not being able to fill all requests for the November/December issue. The demand was so great that it caught us off guard and completely exhausted our supply. However, this situation has been corrected and everyone wishing a copy of the January/February issue can be sure he will receive one.

To our readers who were interested in gift subscriptions, we agree — MONTANA OUTDOORS would make a very special Christmas gift. Unfortunately we aren't adequately set up to offer gift subscriptions at this time. Keep an eye on future issues for information concerning gift subscriptions.

Keep the comments coming. We deeply appreciate your interest in our efforts to conserve the quality environment in Montana.

—THE EDITOR

know your pesticides

by Harley Yeager

Twenty-five years ago the development of DDT marked the beginning of chemical warfare against mankind's oldest enemies—destructive insects and other pests. Now the slow build-up of chemicals in the environment is causing problems undreamed of 25 years ago.

Destruction such as fish kills, the loss of song and game birds and the contamination of big-game species occurs more and more frequently. And ironically, some insects have developed a resistance bordering on immunity to DDT and even stronger chemicals.

HARD PESTICIDES

Pesticides are chemicals used to kill destructive "pests:" insects (insecticides), undesirable vegetation (herbicides), smut and rust in grain crops and fungi in various industrial processes (fungicides).

Pesticides are classified according to their stability—how fast they break down in the environment. The most stable group of pesticides is the chlorinated hydrocarbon group, also known as "hard" pesticides. These chemicals may still be present in the environment 20 to 30 years after their initial use.

Among the hard pesticides are the insecticides DDT, aldrin, dieldrin, endrin, heptachlor, lindane and chlordane. The rate at which they decompose in the environment is extremely variable, depending on local conditions. They may disappear in one area only to move to other areas by means such as flowing into streams or ground waters.

These pesticides can travel extremely long distances in water or air. They attach to dust particles, are picked up and carried by winds and returned to earth by rain drops or direct fallout. DDE, a breakdown product of DDT, is considered

Aerial spraying has contributed significantly to the one million pounds of DDT now floating in the atmosphere. (F&G photo by Tom Smith)

DDT residue accumulates in blue grouse after eating insects, berries and leaves that have been sprayed.

the most abundant synthetic compound present as a pollutant in the world's environment. According to an article in **Science** magazine, **there are more than one billion pounds of DDT and DDE floating in the atmosphere.** DDT has even been found in the fatty tissues of polar bears and penguins.

Besides poisoning animals directly, pesticides can kill through secondary poisoning, which occurs when an animal eats a poisoned animal. Pesticides stored in fat may poison an animal which is forced to live off its own reserves of fat during a food shortage.

It is the tendency of hard pesticides to build up (concentrate) in living organisms by a process known as biological magnification that makes them so dangerous. Small amounts of the pesticide accumulate through each step of the food chain until the last member of the chain—for instance, a fish-eating bird—ingests a great amount of the pesticide.

An example of this phenomenon occurred recently in California where DDT was used to rid a lake of midges. The initial application of the pesticide to the lake was at a level of .02 of one part per million parts water. Thirteen months later, analysis showed that the residue levels were 10 parts per million in plankton, 903 ppm in the fat of plankton-eating fish, 2,690 ppm in the fat of carnivorous fish, and 2,134 ppm in the fat of fish-eating birds, most of which had died. **In 13 months DDT had become 100,000 times more concentrated!**

In the summer of 1963, blue grouse collected from a study area in western Montana nine hours after spraying with DDT during a spruce budworm treatment project showed DDT residues of 1.6 ppm. Nine months later fat samples from grouse collected in the study area showed DDT concentrations of 110 ppm. Apparently, the grouse had accumulated the DDT from eating insects, berries and leaves.

Another dangerous characteristic of hard pesticides is their effect on the reproductive capacity of birds and fish. They can destroy the ability of these animals to produce any living young. The pesticide stimulates the liver to produce enzymes that break down sex hormones which are necessary for successful breeding behavior and the formation of eggshells. Birds suffering from chronic DDT poisoning lay thin-shelled eggs or eggs without any shell. These eggs usually break during incubation or they lose water through the shells, which causes the embryo to dry out.

According to University of Wisconsin Ecologist Joseph Hichey and other authorities, **DDT and DDE have caused a disastrous decline in the population of the bald eagle, osprey, peregrine falcon, brown pelican, Bermuda petrel and similar fish-eating birds.**

Hard pesticides may also have carcinogenic, or cancer-causing, properties. Studies conducted on mice by the National Institute of Health, U.S. Department of Health, Education and Welfare, showed that large amounts of DDT can cause brain tumors, liver and lung cancer and eventual death. However, the final report stated: "At the present time, there is no way to predict whether man may be more or less susceptible than the mouse to the induction of tumors by the compounds reported here. It should be stressed that the dose received by the mice was far in excess of that likely to be consumed by humans."

In 1966, a U.S. public health study showed that the average American carries 12 ppm DDT in his fatty tissue as well as .15 ppm dieldrin.

A year earlier another public health survey found that mothers get rid of DDT while breast-feeding babies. One U.S. Agricultural Department report showed that milk from 32 mothers averaged 132 ppm DDT—which is 440 times the tolerance limit of .3 ppm DDT acceptable for milk used for human consumption.

No one really knows what effect pesticide con-

EDITOR'S NOTE—Harley W. Yeager, 33, is the Fish & Game Department District Information Officer in Billings. He received a Bachelor of Science degree in fish and wildlife management from Montana State University, Bozeman, in 1962, and has completed one year of graduate work. He served as District Information Officer in Glasgow before accepting the Billings position.

centrations are having on man. Since DDT's effects are so severe in nature, some scientists think it will eventually affect man in the same way it now affects wildlife. According to Dr. David R. Metcalf, University of Colorado, men who are consistently exposed to such chemicals show a deterioration of memory and reaction time. However, other scientists consider the dangers of hard pesticides to be vastly exaggerated.

No matter how a person feels about the possible effects of persistent pesticides on mankind, the fact remains that the Food and Drug Administration has set the standard of 5 ppm of DDT as the tolerance level beyond which meats cannot be used for human consumption. **This tolerance level makes the average American, with his 12 ppm, quite unpalatable.**

SOFT PESTICIDES

Pesticides that break down rapidly in the environment are known as "soft" or short-life pesticides. They do not build up in the environment and in the bodies of fish, birds and other animals. However, some of the soft pesticides are extremely toxic and their effects on living organisms are more immediate than those of the long-lived pesticides. Soft pesticides can create environmental problems just as readily as the most persistent types.

More research is needed on the effects of pesticides on big game animals. (F&G photo by Lloyd McDowell)

Some of the most toxic soft pesticides belong to the group of organophosphates, which includes parathion, methyl parathion, TTEP (tetraethyl pyrophasphate) and azodrin. Organophosphates have caused serious illness and sometimes death by direct intake of the chemicals, by direct contact with the chemicals through the skin when spraying, and from residues on fruit crops.

Short-lived pesticides which are not known for their toxic effects may also be dangerous to man. Tests of these pesticides have found that they can cause birth defects in experimental animals. Insecticides such as diazinon, phalton, captan and sevin when injected into chick embryos cause malformations, according to the Food and Drug Administration. In October, 1969, a report of the National Cancer Institute showed that some herbicides used for defoliation purposes in Vietnam—such as 2,4,5-T—caused birth defects in experimental animals.

Soft pesticides such as baytex, used in mosquito-control programs in Montana and adjoining states, are used in other countries under a different name for controlling birds. When baytex was aerially sprayed over Grand Forks, North Dakota, several hundred birds comprising 37 different species were killed.

Often it is not the chemical used, but its method of application, which determines whether or not a pesticide is safe. During the summer of 1970, weeds along a Yellowstone River fishing access roadway were "sprayed" in Sweet Grass County. What actually happened was that the target weeds were missed while nearby willows took the brunt of the spray and were killed.

Even when the target is hit, soft pesticides can cause severe environmental problems. An example is the reduction in the number of sage grouse when their natural habitat — sagebrush — is destroyed by herbicides in order to clear more land for crops and grassland. Studies by the Fish and Game Department show that the sage grouse population has decreased in areas of Meagher County where sagebrush habitat is being sprayed by herbicides such as 2,4-D. Similar investigations into the effect of spraying on plant and animal life have been conducted since 1965 by the Fish and Game Department and the Bureau of Land Management near Winnett.

Not only sage grouse are affected, but mule deer and antelope as well. Sagebrush makes up more than half the winter diet of antelope, and is an important food of mule deer in summer and fall. The destruction of sagebrush in certain areas is resulting in their disappearance from those areas.

MERCURY-BASED PESTICIDES

The most recent source of controversy among environmentalists is mercury-based fungicides. Problems associated with the use of these chemicals were brought to light in the fall of 1969 when wildlife workers found three to 10 times the permissible level of mercury in the flesh of pheasants and Hungarian partridges collected in Alberta.

Montana pheasants have been tested for mercury poisoning. Although residues were found, it is believed that they are below a level that would endanger human health. (F&G photo by Vern Craig)

Canada. The tolerance level of mercury allowable in meats used for human consumption has been set at .05 ppm by the World Health Organization and at zero by the Food and Drug Administration. The FDA has since set a temporary tolerance level of .5 ppm mercury in food.

Mercury contamination in Canadian game birds was attributed to mercury-based fungicides used as cereal seed treatments to prevent smut, rust and various other seedling diseases. Spillage of treated grain during handling, transporting, planting and dumping was the major source of wildlife contamination. Both Canadian and Swedish research has shown that birds containing high mercury residue levels have a lowered reproductive potential, a lower survival rate and damaged central nervous systems. Partridge and pheasant hunting season in Alberta was closed last fall "until further notice."

Dr. John S. Anderson, executive officer of the Department of Health, responded by stating that he did not believe there would be any acute toxic effects from eating Montana pheasants. However, Dr. Anderson felt that there was not adequate knowledge to evaluate the chronic effects of ingesting mercury. It was therefore suggested that persons limit their consumption of pheasants to minimize the possibility of any chronic effects.

In large doses, mercury can be deadly. An example of mercury poisoning in humans occurred in the winter of 1969 in New Mexico. Three members of a family became ill after eating pork from a hog their father had butchered. The farmer had been feeding grain treated with methyl-mercury fungicide to his hogs. Two of his children went into a coma and the third was left blind and paralyzed.

Fish collected from the Clark Fork River near Missoula in the fall of 1969 showed mercury residue up to .28 ppm, very near the maximum safe level of .5 ppm. The source of mercury in the Clark Fork has not yet been determined.

ACTION TAKEN AGAINST PESTICIDES

Slowly but steadily, action is being taken to turn the tide against the use of harmful pesticides.

Following the discovery of high levels of DDT in western Montana mountain grouse in 1963, the U.S. Forest Service and the Bureau of Land Management ceased use of DDT on Montana's forests.

In 1964, the Fish and Game Commission announced a policy calling for discontinuance of the use of hard pesticides on public lands and a re-evaluation of the effects of herbicides. It pointed out the need for more public information about the overall effects of pesticides.

In June, 1970, Secretary of the Interior Walter J. Hickel imposed a ban on the use of pesticides on more than 500 million acres of Interior lands. Chemicals completely prohibited include DDT, aldrin, the herbicide 2,4,5-T, dieldrin, endrin, mercury compounds and nine other lesser-known agents. However, according to an article by

Richard D. Lyons in a June, 1970, edition of the **New York Times,** the Interior Department had officially banned DDT in 1964, but it was still in use through 1969.

Beginning in late 1969, the U.S. Department of Agriculture announced cancellation or suspension of a number of the registered uses of DDT, 2,4,5-T and one form of mercury. However, this action leaves intact registered uses that account for three-fourths of domestic applications of DDT and 2,4,5-T.

The interstate shipment of mercury-bearing fungicides in bulk was also banned; nevertheless, this ban does not stop the use of mercury fungicides already within a state's boundaries, nor does it stop the interstate shipment of treated grain.

Government officials have conceded that because of legal loopholes and lengthy appeals by manufacturers, some retail sales of the pesticides for uses officially banned will continue until at least 1971 and perhaps through 1974. The restrictions announced so far have barely dented the rapidly growing pesticide market. Some 1,300 pesticide chemicals are blended in 45,000 formulations. Sales are estimated to reach $3 billion by 1974.

Much needs to be done. The DDT actions have left untouched the two crops where 75 per cent of this chemical is used—cotton and citrus fruit. The reason is that government officials are unsure what substitute to recommend that would be less hazardous.

Another problem is what to do with the pesticides that have been banned. During the fall of 1970, a cooperative program with the Department of Health, Montana Extension Service and Fish and Game Commission was set up for disposing of unwanted mercury-treated seeds in land-filled dumps. The Fish and Game Department has previously offered to take and store unwanted pesticides until a safe method of disposal was found. These pesticides are still being stored in a concrete bunker at Glasgow Air Force Base. The bunker was formerly used for storing bombs and ammunition. **Perhaps this is a fitting way to treat pesticides. They appear to be every bit as deadly as any bomb.**

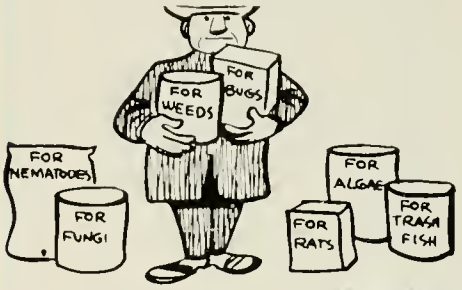
Large fish-eating birds such as our national symbol, the bald eagle, have been hit hard by pesticides. Bald eagles can still be found in Montana. Let's hope it stays that way. (F&G photo by Howard Chrest)

A LIVABLE ENVIRONMENT FOR WILDLIFE IS A QUALITY ENVIRONMENT FOR MAN

PESTICIDE PRIMER

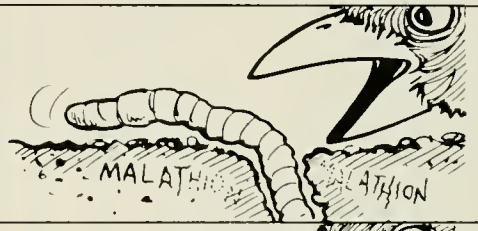
By OZ WARBACH

PESTICIDE : A CHEMICAL USED TO CONTROL OR DESTROY UNWANTED PLANTS OR ANIMALS.



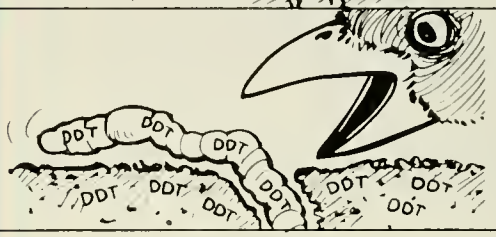
SHORT-LIFE PESTICIDES : THOSE WHICH BREAK DOWN RAPIDLY.

EX: MALATHION IN DAYS
METHOXYCHLOR IN MONTHS



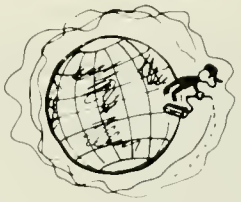
"HARD" PESTICIDES : THOSE WHICH REMAIN UNCHANGED FOR LONG PERIODS OF TIME IN THE ENVIRONMENT. (YEARS FOR DDT)

OTHER EXAMPLES : ALDRIN, DIELDRIN, ENDRIN, CHLORDANE, LINDANE, AND HEPTACHLOR.



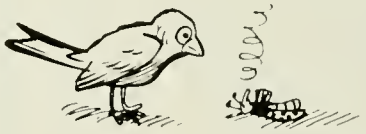
MOVEMENT OF PESTICIDES : WATER, WIND, DUST, AND ANIMALS HAVE MOVED HARD PESTICIDES TO ALL TYPES OF ENVIRONMENTS IN ALL PARTS OF THE WORLD TO AREAS WHERE THEY HAVE NEVER BEEN USED.

EX. ANTARCTIC



SELECTIVE PESTICIDES : CHEMICALS THAT AFFECT TARGET SPECIES ONLY.

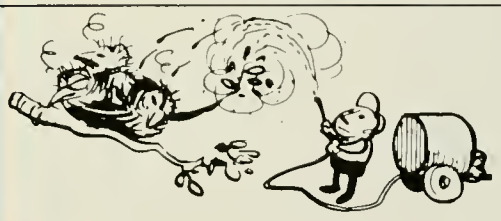
EX.-LAMPRICIDE - KILLS ONLY LAMPREY LARVAE.
PYRETHRUM - KILLS INSECTS, BUT NOT BIRDS.



BROAD-SPECTRUM PESTICIDES: CHEMICALS THAT AFFECT MANY SPECIES:

EX: DDT, MALATHION

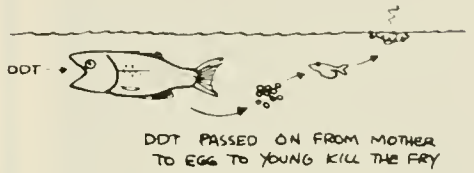
DIRECT KILL : SOME PESTICIDES ARE TOXIC ENOUGH TO KILL SOON AFTER TREATMENT.



VABLE ENVIRONMENT FOR WILDLIFE IS A QUALITY ENVIRONMENT FOR MAN A LIVABLE

INDIRECT KILL: LETHAL EFFECT OF LONG-LIFE (HARD) PESTICIDES SHOW UP SOME TIME AFTER APPLICATION - EVEN IN THE NEXT GENERATION.

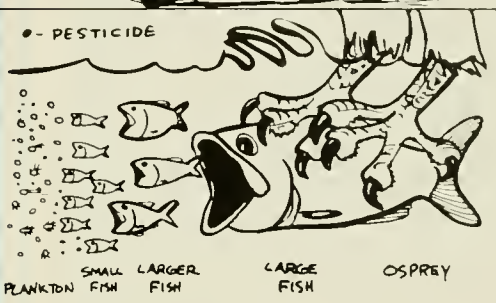
A. THROUGH EGGS



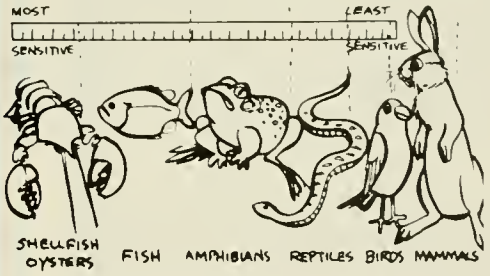
B. THROUGH EFFECT ON REPRODUCTION.

C. THROUGH FOOD - YOUNG DIE FROM EATING CONTAMINATED FOOD.

BIOLOGICAL MAGNIFICATION: SMALL AMOUNTS OF HARD PESTICIDES CAN ACCUMULATE TO LARGER AMOUNTS THROUGH THE FOOD CHAIN.



BIOLOGICAL VULNERABILITY: LIVING ORGANISMS VARY IN THEIR RESISTANCE TO PESTICIDES.

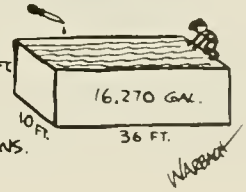


STORAGE: SOME PESTICIDES ARE STORED IN TISSUES OF LIVING ORGANISMS.

EX. DDT IN FAT
OTHER PESTICIDES IN CARROTS, POTATOES, RADISHES.

P.P.M. - PARTS PER MILLION
P.P.B. - PARTS PER BILLION
} TERMS USED TO STATE DILUTION OF PESTICIDES IN ENVIRONMENT AND IN ORGANISMS.

EX. LESS THAN 1 P.P.B. OF ENDRIN CAN KILL SHRIMP. THAT'S ONE DROP IN ABOUT 16,270 GALLONS.



Reprinted courtesy of Michigan Department of Natural Resources.

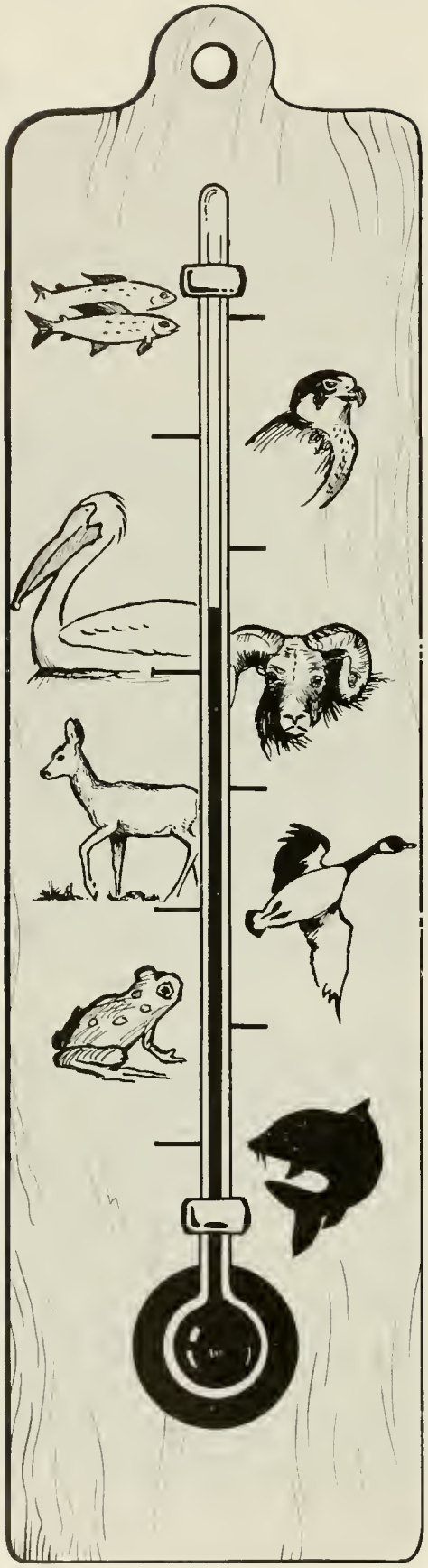
NVIRONMENT FOR WILDLIFE IS A QUALITY ENVIRONMENT FOR MAN ❦ A LIVABLE ENVIRO

Baring a few ugly exceptions, we can honestly say that Montana still has a quality environment

Montanans can brag about their surroundings in any season: winter on Sawtooth Mountain on the Sun River Game Preserve (photo by Eldon Smith); spring (above) on upper McClellan Creek near Helena (F&G photo by Gus Wolfe); fall (upper right) on a back road near Whitehall (F&G photo by Dick Ellis), and summer (lower right) in the Bitterroot Range of western Montana (F&G photo by Bob Carroll).

Let's keep it!

R WILDLIFE IS A QUALITY ENVIRONMENT FOR MAN A LIVABLE ENVIRONMENT FOR WI



Artwork by Vern Craig

A wildlife thermometer?

by Bill Schneider, Editor

Can you imagine a "wildlife thermometer?" It's just like any other thermometer except that it contains wildlife instead of mercury, and measures environmental quality instead of the temperature.

The reason for this analogy becomes obvious when you consider that wildlife, and especially rare wildlife, ranks as probably the best indicator of a quality environment. When the wildlife goes down, the environment follows suit and becomes a little less livable.

The Bureau of Sport Fisheries and Wildlife publishes a listing of rare and endangered species. The most recent list contains the species of Montana wildlife mentioned below. Watch them. If they move on to the "extinct" category, others will probably be added to take their places. When there are no more to add, it will be the coldest day ever in Montana.

Endangered Species:

These species are in immediate danger. They must have help or extinction may follow.

1. Montana Westslope Cutthroat Trout (*Salmo clarki*)
2. Black-footed Ferret (*Mustela nigripes*)
3. Peregrine Falcon (*Falco peregrinus anatum*)
4. Eskimo Curlew (*Numenius borealis*)

Rare Species:

These species may not be in immediate danger of extinction, but they occur in such small num-

EDITOR'S NOTE—William A. Schneider, 24, was appointed editor of the new MONTANA OUTDOORS magazine six months ago, and has worked on various department publications since joining the Information and Education Division in March, 1970. He was graduated from South Dakota State University, Brookings, in 1969, with a Bachelor of Science degree in wildlife management and a minor in journalism.

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bers that they can easily become endangered should their environment worsen.

1. Grizzly Bear
   (*Ursus horribilis*)
2. Prairie Falcon
   (*Falco mexicanus*)
3. Arctic Grayling
   (*Thymallus arcticus*)
4. Northern Greater Prairie Chicken
   (*Tympanuchus cupido pinnatus*)
5. Spotted Bat
   (*Euderma maculatum*)

Status Undetermined Species:

Reports indicate that these species may also be rare or endangered, but more information is needed to determine their exact status.

1. Northern Swift Fox
   (*Vulpes vetox hebes*)
2. Pine Marten
   (*Martes americana*)
3. Fisher
   (*Martes pennanti*)
4. Wolverine
   (*Gulo gulo*)
5. Canadian Lynx
   (*Lynx canadensis*)
6. Ferruginous Hawk
   (*Buteo regalis*)
7. American Osprey
   (*Pandion haliaetus carolinensis*)
8. Columbian Sharptailed Grouse
   (*Pedioecetes phasionellus columbianus*)
9. Mountain Plover
   (*Eupoda montana*)
10. Yakutat Fox Sparrow
    (*Passerella iliaca annectens*)
11. White Sturgeon
    (*Acipenser transmontanus*)
12. Pallid Sturgeon
    (*Scaphirhynchus albus*)

Because of the relative state of all wildlife, the preceding classifications must be somewhat arbitrary. The crux of the matter is not whether a species is "rare," "endangered" or "undetermined." What matters is that these and many other species get protection and get it now! In most cases this protection would be the preservation of their environment.

It's not too late. Something can still be done to save our wildlife and, in turn, maintain a quality environment for ourselves.

Each of the above species has at least one critical situation seriously threatening its survival. Most of their troubles center around decreasing habitat or some other environmental factor. If these conditions are corrected nature will surely rebuild wildlife populations to a level the environment can easily support.

Right now, the wildlife (or the mercury, if you prefer) is slowly dropping. This downward trend must be stopped because if wildlife ever fails to register on the thermometer, what was once a quality environment may not even be a livable environment.

Of course, it's easier said than done, but, nevertheless, the burden rests on our shoulders as Montanans and citizens of the United States to do everything within our means to maintain a quality environment.

If all Montanans join in this fight against environmental degradation by supporting sound management programs and environmental legislation, maybe our wildlife can be saved and Montana's environment kept at a pleasant temperature.

The grizzly bear, a wilderness species by nature, is a perfect indicator of a quality environment. (F&G photo by Lloyd Casagranda)

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WILD RIVERS

Y ENVIRONMENT FOR MAN A LIVABLE ENVIRONMENT FOR WILDLIFE IS A QUALITY EI

The Wild and Scenic Rivers Act promises to preserve at least part of Montana's environment in its natural state.

by Robert Rothweiler

"It is hereby declared to be the policy of the United States that certain selected rivers of the nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations."

So states the Wild and Scenic Rivers Act of 1968. In proposing such legislation President Lyndon Johnson reminded the nation that the time had come "to identify and preserve free-flowing stretches of our great scenic rivers before growth and development make the beauty of the unspoiled waterway a memory."

A Wild Rivers Study Team under the authority of the Secretary of the Interior and Secretary of Agriculture recommended establishment of a system of wild rivers administered either by the states or the federal government. The rivers are dedicated to beauty and to recreation so that their free-flowing identity will be insured.

The act specifies that all rivers in the system must be free-flowing, at least 25 miles long and of a high quality to support fish and other aquatic animals. Shorter stream segments will be considered if they possess exceptional scenic features.

Scenic rock formations help make a float trip down the Missouri River an always-remembered experience. (F&G photo by Dick Ellis)

The South Fork of the Flathead River matches the scenery of the North Fork by winding its way through the world-famous Bob Marshall Wilderness. (F&G photo by Otis Robbins)

'he North Fork of the Flathead River flows hrough northern Montana, lined with the plendor of Glacier National Park on one hore and the Flathead National Forest n the other. (F&G photo by Otis Robbins)

The Big Hole River meanders through southwestern Montana, providing some of the best trout fishing found anywhere.

The Middle Fork of the Flathead River (above) gives up many fine catches of Dolly Varden Trout like these (left). (F&G photo by Otis Robbins)

Extensive areas will be made available for recreation and scenery protection along wild rivers flowing through public lands. Wild rivers on private lands need only enough land necessary to protect the character of the stream and to provide public access.

The Wild Rivers Act named eight streams for immediate inclusion in a National Wild and Scenic Rivers System and authorized 27 other streams to be studied for possible addition. Two Montana rivers will be studied—the Three Forks of the Flathead and the Missouri River below Fort Benton. Last September, the Secretaries of Interior and Agriculture announced a possible addition of 47 rivers to the system, including the Blackfoot River from Landers Fork to Milltown Dam, the Madison from Earthquake Lake to Ennis Lake, and the Yellowstone River from Yellowstone National Park to Pompey's Pillar in Montana.

The establishment of a system of wild rivers will provide recreational opportunities unavailable anywhere else. Past and present generations have enjoyed these wild streams and their unique character should be preserved for future generations.

Such a system should disprove a sad prediction of the late naturalist, Aldo Leopold: "Perhaps our grandsons, having never seen a wild river, will never miss the chance to set a canoe in singing waters. I am glad I shall never be young without wild country to be young in."

Free-flowing streams played an important role in the exploration and settlement of Montana. Rivers beckoned and bore adventurers like Lewis and Clark to this land. Later in the 1800's, the streams were used for navigation and transportation. During these early years, man gave little thought to recreational use of the rivers.

As material needs increased, the rivers were changed to meet these needs. The strength of the rivers was harnessed by dams, diverted for irrigation and dredged for water control. After man had fixed the wild stream to his liking, he asked, "What happened to the cutthroat? What happened to the grayling?"

Quite a few years ago, Montanans started wondering why fish were found in some streams and not in others, and why trout fishing was better in one stream than another. Fishery investigations over the years collected considerable information about Montana streams. Some produce more trout than can be taken by anglers while other streams are poor producers. Many streams used to have good fishing, but man's activities have destroyed their ability to produce trout.

Recognizing the need for an inventory and classification of Montana's trout waters, fishery workers of the Montana Fish and Game Department, Montana State University and the U.S. Fish and Wildlife Service worked for many years on a stream-fishery classification system, rating the streams of the state on their importance to Montana and the entire United States. They based fishery values on the biology of the streams as well as on social and economic considerations. The criteria applied to each stream included productivity, fisherman use, availability and aesthetics.

The inventory indicated less than 4,000 miles of streams were of value as a fishery to most of

Rock Creek near Missoula adds considerably to the already excellent fishing of western Montana. (photo by Don Aldrich)

Montana and only 452 miles could be classed as "blue ribbon," or of national as well as statewide value. The upper sections of the Yellowstone River, parts of the Missouri River, the Madison River, the Three Forks of the Flathead River, the West Gallatin River, the Big Hole River and Rock Creek were rated as blue-ribbon streams, which wasn't a surprise to fishermen. These streams were well-known for fishing long before there were any official pronouncements.

Classifying the streams was only part of the job. Researchers then needed information about fishermen. Fishing is the most important outdoor recreational activity in Montana. Fishermen comprise 25 per cent of the people who travel for recreation in the state. A survey, conducted by the Fish and Game Department in 1960, determined that anglers in Montana spend more than $36 million yearly for fishing, including equipment, food and lodging, travel and incidentals.

From these surveys, some interesting facts about anglers were brought to light. Most fishermen prefer trout fishing in streams to other types of fishing. An even higher percentage of nonresidents are stream fishermen. Out-of-state fishermen travel to Montana for stream fishing. They can fish in lakes and reservoirs at home, but they can't watch a fly riding the ripples of a blue ribbon trout stream.

Another factor deserves consideration in a discussion of Montana's waters. Most of the trout caught in these streams are wild fish—fish produced in the stream under natural conditions. Every year more wild trout find their way into creels in spite of the large number of hatchery fish released into these same streams.

The implications for Montana's outdoor recreation are obvious. Quality fishing exists in Montana for residents and nonresidents. Right now, many streams still provide quality fishing. Whether they will provide quality trout fishing in the future depends on the care and protection they receive.

Industrial and agricultural demands are using up Montana's remaining wild rivers. A single dam or irrigation diversion changes the character of the river forever. Federal and state provisions have now been made to keep Montana's rivers or portions of them wild and free, protected from uses that destroy their natural beauty and recreational desirability.

Montana is deeply involved in outdoor recreation, which is emerging as a major industry in the state. This, in large part, is because Montana has natural resources that are unequalled elsewhere in the United States. The success of outdoor recreation programs depends on whether these unique resources can be developed for public use and still maintain the quality of resources that people are looking for. Natural streams with physical characteristics to produce wild trout are indeed unique.

EDITOR'S NOTE—Robert A. Rothweiler, 40, is the Fish & Game Department District Information Officer in Bozeman. He received a Bachelor of Science degree in wildlife management from the University of Montana, Missoula, in 1957, and a Master of Science degree from Montana State University, Bozeman, in 1960.

A LIVABLE ENVIRONMENT FOR WILDLIFE IS A QUALITY ENVIRONMENT FOR MAN A

Fishing success on this section of Rock Creek near Red Lodge was greatly reduced after rechanneling destroyed much of the essential fish habitat. (F&G photo by Perry Nelson)

by Keith Seaburg

Large, well-known rivers like the Yellowstone, Flathead and Missouri get lots of attention nowadays. Everyone is concerned about what is happening to these larger streams, but what about the small ones?

Small, free-flowing streams have a rare and beautiful quality that attracts myriads of fishermen, hikers, picnickers, birdwatchers and many other people who just want to enjoy the out-of-doors.

Many of these streams are rapidly losing their value to the outdoor recreationist. Bank vegetation is slowly being destroyed. When this vegetation is gone, the destructive agents of erosion go to work creating a sluggish, sediment-loaded stream with almost no recreational value. Other streams are straightened and rechanneled until they become raging torrents in the spring and trickles in the fall.

Small stream fishing, an inseparable part of Montana's sporting heritage, is in trouble.

Three people have consented to give their views about what is happening to Montana's small streams. Harold Miller, former teacher and rancher, tells a story about Sarpy Creek based on 60 years of living along its banks. Gay Easton tells of Rock Creek near Red Lodge where he fished for more than 30 years. Joe Halterman, a rancher and former fisheries biologist, describes Lower Deer Creek near Livingston, which is losing its fight as a producer of cutthroat trout.

SARPY CREEK

(as told by Harold Miller)

"Sixty years ago we settled on Sarpy Creek. It was a beautiful little creek, meandering through the alfalfa fields. The banks were lined with willows and cottonwoods. The water was clear and clean. We swam in it and we drank it. Pollution was unheard of. Ecology? I didn't know what the word meant. Extensive farming and ranching have changed all this, especially the four or five miles of the creek where the dryland stops and irrigation begins. I don't think you would want to swim in it today, much less drink it.

"Where the elk, buffalo and deer used to winter there are now hundreds of cattle which cause serious damage to the vegetation along the banks of the creek. Modern methods of farming, insecticides, commercial fertilizers and silt have all contributed their bit, along with the cattle, to deteriorate the quality of the water.

"The main drainage canal from Hysham to Sanders flows directly into Sarpy Creek and from there into the Yellowstone. Probably Sarpy alone is not a major contributing source of water pol-

Fishing on the Yellowstone River. (F&G photo by Robert Rollweiler)

lution, but if you consider the entire drainage system from Livingston to the Dakota line, then we are talking about something else again.

"Much has been said and written about our blue ribbon trout streams from Billings westward, but there has been little publicity about the Yellowstone and its tributaries to the east. Much money and personnel will be needed to correctly evaluate the situation. But I think it would be money well spent.

"In all fairness to the farmers and ranchers, I must admit that much has been done to alleviate the situation the past few years. Hundreds of dams have been erected. New methods of irrigation have been instigated. More care is taken with the use of poisons and fertilizers and better range and grass management is being practiced. But much remains to be done. I would like to see every mile of our creeks, rivers and reservoirs fenced off from depredation by livestock. This would cost millions. The ranchers could ill afford it, but an aroused and informed public could. Boy, oh boy! Would this keep us in the game business. Think of it, all you sportsmen and conservationists."

It would be comforting for Mr. Miller to remember his childhood and find things unchanged. However, the cottonwoods and willows are not recycling on Sarpy Creek as they have for eons past. The change is because of modern man and the push to produce more and more on the same land.

As Miller suggests, the solution is to fence the stream banks—but it isn't being done. With federal cost share funds available, Missoula County did not have a single cost share project last year. Under the administration of the Agricultural Stabilization and Conservation Service (ASCS) eligible landowners pay only 20 per cent of the cost and often the landowner's share is made up by doing the fencing himself.

Gay Easton's story of Rock Creek is similar. The creek is different but the basic problem is the same.

ROCK CREEK

(as told by Gay Easton)

"I started fishing Rock Creek in the middle forties, before there were too many man-made disturbances. There were many twists and turns in the river with large pockets of downfall entangled along the banks, making good stable bank protection for the spring run-off. The grassy banks mingled with willows and cottonwoods and were in abundance on nearly the entire stream from Red Lodge to its confluence with the Clark's Fork of the Yellowstone below Rockvale. This created a great challenge to the fisherman and excellent fish habitat.

"The middle half of Rock Creek from Red Lodge to Joliet, where Red Lodge Creek flows into Rock Creek, was the prime fishing area. This was one of the best fishing streams in the state.

"In the late forties a large fire in the upper watershed created a severe runoff problem in the

The first photo shows the banks of the West Gallatin River in 1924 before the elk were forced to seek out the willows for winter food.

After many years of overgrazing, the willows are gone and so are the elk. (F&G photo by Robert Rothweiler, 1968)

VIRONMENT FOR WILDLIFE IS A QUALITY ENVIRONMENT FOR MAN A LIVABLE ENVIRO

This is how a stream bank should look. Bank vegetation is essential to a healthy trout population. (F&G photo by Keith Seaburg)

early spring, putting a tremendous strain on the banks. In most cases the natural buildup of bank protection survived. I'm sure there were local landowners who had flooding damage, and it looked at the time as if channel work should be performed.

"In the late fifties an extensive amount of channel clearance and realignment began, some under private funds and then under a soil conservation program. Straightening, widening and clearing of the natural soil bank, removing the natural habitat for fish and ridding the stream of its meandering effect created many unforeseen problems. The loss of habitat and the problem of pollution from silting changed a fisherman's haven into a wild torrent in the spring and a trickle in late summer. The demand for water by agricultural users in the dry years has been so great that the protection of a fishery cannot be guaranteed."

Studies of Rock Creek by Montana Fish and Game Department biologists began about 1961. These reveal the tremendous changes that have taken place in the last 10 years. Two adjacent areas on Rock Creek, each about 4000 feet long, were measured before and after a spring freshet. The 4000 feet of overgrazed, sparsely vegetated floodplain moved seven times as much as the 4000-foot-long wooded floodplain. Almost 3300 feet of the overgrazed section moved, compared with 475 feet of the more heavily vegetated section. It is obvious that the natural woody vegetation prevented severe land loss through erosion.

In the natural area there were 13 percent more pools per mile, a deeper and narrower stream and twice as much cover per mile of stream. The gradient in the ungrazed and wooded section is also less, averaging 66 feet of drop per mile of stream. The drop of 74 feet per mile in the overgrazed section is a double-edged sword. The faster flow is more erosive and the denuded bank cannot withstand the force of the water.

Biologists have discovered a reduction of fish stock in the overgrazed section. In each acre of the natural area 155 pounds of trout thrive, but in the overgrazed section only 121 pounds.

"Rock Creek . . . was one of the best fishing streams in the state," said Easton, and unfortunately the past tense is accurate. With wise management, perhaps in 100 years Rock Creek might again live up to its old reputation.

Joe Halterman had a favorite small stream, but it has changed in the 40 years he has known it.

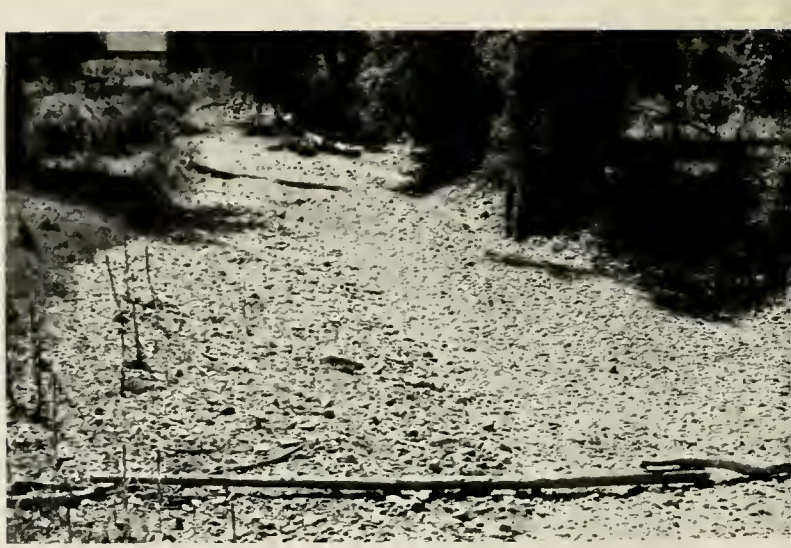
LOWER DEER CREEK

(as told by Joe Halterman)

"How would you like to take the family to a small creek where everyone will make a nice catch of chunky cutthroats in two or three hours of relaxed fishing? A place where most any rod and line, a couple of Royal Coachmen or size 8 'bait hooks,' and you are in business? A place where the youngsters and the grandparents will be equally

EDITOR'S NOTE—Keith G. Seaburg, 45, was recently appointed District Supervisor for the Fish & Game Department in Miles City. Prior to this he served as District Information Officer in Missoula. He was graduated from the University of Minnesota, Minneapolis, in 1950, with a Bachelor of Science degree in wildlife management. Before moving to Montana, he was a fisheries and water pollution control biologist in Minnesota and South Dakota.

Lower Deer Creek used to be good fishing all the way to its confluence with the Yellowstone River. (Photo by Joe Halterman)



Since 1950, irrigation and other agricultural uses have completely dewatered Lower Deer Creek from mid-summer to mid-fall. Trout need water the year around! (Photo by Joe Halterman)

at home in a simple yet genuine association with nature? A place where you will not be wondering 'What made all the mud,' 'What happened to the water,' or 'Why did they dike off that good bend of the stream?' A creek with plenty of elbow room . . . Dreaming? Maybe today, but not years ago when Lower Deer Creek, a few miles east of Big Timber, was just such a stream.

"The excellent fishing of Lower Deer Creek 40 years ago is long gone. The steep upper part has never been more than marginal fishing, but the lower, gentle-gradient reach had the chunky cutthroats. This lower reach of the creek has simply run out of water. As the diversions increased, the number and size of the trout decreased until Lower Deer Creek joined the ever growing list of streams that 'used to be' good fishing.

"Many fishermen, overwhelmed by the sheer expanse of big water, prefer a small creek. A healthy 12-incher on a light tackle in the close quarters of a small creek is every bit as thrilling as a three-pounder on triple-hooked hardware in big waters. If I had the choice of three miles of what Lower Deer Creek used to be like, or 75 acres of hay meadow it would irrigate, I'd take the stream. The access charge per person per day would not need to be much to equal the income from the hay, it would be a lot less work, and a lot of fisherman families would have fishing like it use to be.

"Years ago, when streams like Lower Deer Creek were more numerous across Montana, we believed that perpetuation of the fishery would be a cinch with ample stocking and ample regulation of the fishermen. Forty years of hindsight together with an awareness of the advantages of working with, rather than against, the laws of nature have given us an entirely different point of view. Now we know that habitat is a basic prerequisite. Without suitable habitat the best management schemes are of little avail.

"The loss of a single small creek may seem insignificant, but how many 'Lower Deer Creeks' have we lost since 1920? Think of the countless tributaries that ran all year to the parent stream —from the Yellowstone to the Bitterroot, from the Flathead to the Smith, the Judith and the Musselshell. We have probably lost the best parts of at least 100 creeks that were at one time trout havens. Rather than embarking on a million-dollar computerized hatchery, it might be better to spend the million on access and the preservation of natural stream habitats that are still with us."

Halterman's question—"How many Lower Deer Creeks have we lost since 1920?"—cannot be answered exactly. We do know that only 450 miles of blue ribbon streams remain in Montana. Sarpy Creek does not provide the fishing and the associated recreational benefits it once did. By Easton's estimation, Rock Creek is not as good as it once was or might be. In Lower Deer Creek there is no water, no fish.

It would be a waste of effort to clean up the major rivers of Montana if we allow hundreds of tributaries to dump silt into them; and it would be a shame indeed if Montana ended up with too few good tributaries to support that special group that enjoys small stream fishing.

AIR POLLUTION

Is it on it's way out?

by Benjamin Wake, Director
Air Pollution Control Division
Department of Health

Have you ever said something like, "Come out to Montana and get some clean air," or, "You just aren't used to all this clean air?"

These statements are certainly true when you consider that Montana as a whole has cleaner air than most other states. However, have you ever tried to tell the people in Missoula, Billings or Columbia Falls about it? The people living in these areas **know** that Montana has air pollution problems. They also know how miserable it can be.

Let's take a closer look at the problem. The Air Pollution Control Division has designated the following 12 sources as causing most of Montana's dirty air:

1. The burning of wood waste at sawmills and lumbering operations (teepee burners).
2. Slash burning in forests.
3. Open burning of any type, including backyard trash burning and community garbage dumps.
4. Emissions of sulfur dioxide (SO_2) from smelters at East Helena, Anaconda and Great Falls.
5. Dust from unpaved roads.
6. Particulate matter (minute airborne solids) and odorous gases from the pulp mill in Missoula.
7. Hydrocarbons, carbon monoxide (CO), sulfur dioxide (SO_2), hydrogen sulfide (H_2S) and other emissions from petroleum refineries, particularly in Laurel and Billings.
8. Fluorides and particulate matter from the aluminum reduction plant in Columbia Falls.
9. Dust from asphalt plants and gravel crushing operations.
10. Odors from rendering plants, slaughter houses and chicken-raising operations.
11. Odors from stockyards and feed-lot operations.
12. Emissions from automobile engines.

All these sources must inevitably reduce their emissions. Progress is being made in most, especially in teepee burner operations, asphalt plants and all other sources involving particulate matter. **We expect the various smelters, the aluminum plant at Columbia Falls and slash burning to present our most serious compliance problems.**

EDITOR'S NOTE—Benjamin F. Wake, 45, is director of the State Department of Health's Air Pollution Control Division in Helena. He formerly served on the Water Pollution Control Board in Denver, Colorado. He received a Bachelor of Science degree in civil engineering from the University of Colorado at Boulder in 1950, and a Master of Public Health degree from the University of Pittsburgh in 1955.

Montana's air pollution program comes from the Clean Air Act, a product of the 1967 state legislative session. This act provides for the conservation of Montana's air resources and the prevention, abatement and control of air pollution. More specifically, the act provides for maintenance of levels of air quality that will protect human health and safety, prevent injury to plant and animal life and property, promote the economic and social development of the state and facilitate the enjoyment of our natural resources.

The Clean Air Act set the stage for several moves by the Air Pollution Control Division of the Department of Health. These actions include:

1. Ambient clean air standards were adopted on May 27, 1967. This action laid down the guidelines and goals for air quality in Montana.
2. Regulations regarding the issuing of construction permits were set on March 23, 1968. Since this date any industry considering construction or alteration of equipment capable of emitting air contaminents into the atmosphere must obtain a permit from the Department of Health. The purpose of this regulation is to insure that any new industry will be provided with the maximum air pollution control capability which is technically practicable and economically feasible.
3. In November, 1968, the Department of Health adopted its specific emission standards. Dates were established for compliance with these standards. Since then, several one-year variances have been issued, but the emission standards still stand.
4. The Department of Health has also adopted special standards covering sulfur emissions from smelters and fluorides from aluminum reduction and phosphate plants.
5. Presently, work is underway to set up local air pollution control programs to increase the effectiveness of air pollution control in Montana. Regional inspectors have been enlisted and trained to identify pollution sources and violations. More are being trained as the need for them increases.

If the guidelines set down by the Department of Health are met, Montanans will be able to enjoy clean air. The problem is enforcement. Legal methods involved in enforcing such a law are often time-consuming and inefficient.

Ahead of us lies a long battle, but it can be safely predicted that by June 30, 1973, most polluters (with the possible exceptions of slash burning and other open burning) will find themselves complying with the Clean Air Act of 1967.

Photo by Air Pollution Control Division

F&G photo by Tom Smith

Air, because of its natural state, is often hard to photograph, but not always!

According to the Air Pollution Control Division of the Department of Health, Columbia Falls and the Flathead Valley rank as Montana's most serious air pollution problem. The Missoula Valley (above) also has its air pollution problems.

Environmental conservation can CREATE jobs.

by James Posewitz

"If you force me to clean up my operation, I'll have to close down and put a lot of men out of work." This complaint often plagues people struggling to clean up Montana's environment. In fact, it seems to be the first reaction on the part of a developer or polluter who is told that it is time to come clean environmentally.

It is not a new excuse. Individuals involved in Montana's struggle to maintain a quality environment have heard it many times. The "ease off or we'll shut down" threat has set off countless environmental battles.

One of the earliest battles involved preservation of Montana's trout streams. In the early 1960's the threat was that if the Stream Preservation Act was enacted into law, highway construction in Montana would cease. In 1963 the legislature decided to take a chance and passed the first Stream Preservation Act in the nation. It required that the physical features of streams of good fishing quality be maintained. Seven years later highways are still being built, and just as many men as ever are being employed to build them.

Perhaps one of the best examples of the net effect of the Stream Preservation Act is the new section of highway currently under construction between Helena and Great Falls along the Missouri River, one of Montana's finest trout fishing rivers. Without the Stream Preservation Act, it is quite likely that there would be two fewer bridges on this section—bridges built by men. This demonstates the fact that taking care of the environment requires extra work and additional employment. Seven years ago, without realizing it, the legislature created Montana's newest, most promising industry—environmental care.

Nowadays, roads are a little longer, they have more bridges and admittedly they cost more. They are more expensive because they are built to accommodate other values—environmental values—that were previously ignored. Today these highways are more than the shortest distance between two points. They are transportation corridors that offer a multitude of benefits.

This concern for our environment has spread from trout streams to other areas of activity, but the old complaint is still heard. Developers accuse conservationists of trying to stop progress, preventing development and putting people out of work. These accusations are as false today as they were in 1962. Strip-mining operations in eastern Montana offer another example of the invalidity of the developers' arguments. **Conservationists are not fighting to put men out of work, but to put men to work.** More men are necessary to

EDITOR'S NOTE—James A. Posewitz, 35, is chief of the Environmental Resources Division of the Fish & Game Department in Helena. He majored in fish and wildlife management at Montana State University, Bozeman, obtaining a Bachelor of Science degree in 1957 and a Master of Science degree in 1961.

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restore the land to a productive capacity so that it can be used after the miners have gone.

Several times in the past, conservationists have squared off with water development interests. Today progress is being made to resolve these differences. Under a Fish and Game Commission program, three men are at work at Libby trying to make the Libby Dam project as ecologically sound as possible. One man at the Clark Canyon-Beaverhead complex is studying the ecology of the river and how the project affects it. One man has been assigned to work at Lincoln with the objective of making the developing mineral complex compatible with the environment. Understanding these projects will enable conservationists and water developers to design better and more compatible projects in the future.

Environmental care does not eliminate jobs, it creates them. It takes men and their minds to develop projects that not only accomplish the developers' objectives but that are also compatible with an area's ecology. Men can do this. Machines and cost-benefit ratios cannot.

Conservationists have pointed out these facts for years. Now support is also coming from industrial interests. At a recent hearing in Helena, a representative of a diversified international mining company made the following statement: "We have found, strangely enough, that quite in contradiction to the frequent assertion that the costs of environmental control represent huge, unrecoverable expenses which must be reflected in consumer price, our corrective installations have, for the greatest part, quickly paid for themselves in better quality and better quantity of recovered production, increased profits from byproducts earlier lost or disregarded, decreased public legal liabilities, better health and less loss of work hours of the employee body, etc."

In its brief history the environmental preservation movement has accomplished significant changes within Montana. There is a new cement plant, a new zonolite plant, improved lumber mills and a soon-to-be-improved pulp mill. These actions represent a commitment of millions of dollars to achieve better production and a cleaner environment. It is becoming apparent that rather than being an economic depressant, environmental care is rapidly becoming an economic stimulant for Montana. As long as the public remains concerned and involved in the drive for a clean environment, these things will continue to happen.

Some individuals still insist that environmental concern is a passing thing and that soon developers will return to their dirty ways. Yet mounting evidence shows that the trend towards industrial growth is being met with an ever-growing concern for the preservation of the environment.

Four bridges were constructed along a three-mile stretch of Interstate 15 near Craig, Montana. Without these bridges, the highway would have chopped off a couple of the natural meanders and greatly reduced the fish population in this blue ribbon section of the Missouri River. (F&G photo by Tom Warren)

In an article entitled "The Environment Must Be Preserved," the president of Humble Oil and Refining Company wrote: "Anyone who still believes that the concern of the American public on this issue is merely a passing fancy has simply failed to measure the accelerated tempo of national feeling. Society is demanding action, and we as businessmen will be making a monumental miscalculation if we misinterpret either the seriousness or the urgency of this demand."

Perhaps now is a good time to stop threatening each other and face the problems together. How can this be accomplished? By putting men to work —men who will work with their hands and with their minds and with a dedication to preserve for Montana the quality of life that those who live here enjoy and deserve.

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The sun sets over the Mission Mountains (photo by Bill Browning, Montana Chamber of Commerce).

THE FUTURE– fortune or failure?

by Bill Schneider, Editor

It seems like the proper thing to do nowadays is to kick off any article concerning the future of our environment with a few staggering statistics and dates. Well, here they are:

. . . By the year _____ at least __ percent of Montana's population will have starved to death because of the state's inability to grow its own food. This tragedy will occur after __ percent of the state's best agricultural land has been overturned and left sterile by extensive strip-mining operations. Montana will not be able to obtain any food from anywhere else in the world.

. . . By the year _____ there won't be a clean drink of water in Montana because of industrial, agricultural and municipal pollution.

. . . By the year ____ Montana's few remaining wilderness areas will have to be fenced off and a daily fee of $____ charged for their use. Of course, this will apply only to the people lucky enough to draw a special hiking permit at the statewide drawing.

. . . By the year ____ about __ per cent of Montana's best topsoil will have wasted away because of outmoded soil conservation methods. The agents of erosion will be so well established that it will be __ years before the land can again produce crops or fatten livestock.

. . . By the year ____, __ percent of the people living in __ mountain valleys will be forced to migrate to areas over ____ feet in elevation in order to escape a painful death from air pollution.

So much for the "doomsday syndrome." Fill in your own numbers and dates. They will probably be as accurate as some. Now let's take a look at what is really happening to our environment.

. . . The Bureau of Land Management has offered its first coal lease that requires the reclamation of strip-mined lands. The lease covers a 4,306-acre plot of land near Colstrip in Rosebud County. The lease stipulates that the mining company must stockpile soil material that is capable of supporting vegetation. The soil will then be used to re-cover the areas after the coal has been removed. Considering that eastern Montana has an estimated 1.7 million acres of federally-owned land underlaid with stripable coal deposits, this action may be a giant step toward preventing a catastrophic assault on the environment.

. . . In addition to the new lease, a revision of the laws that regulate surface mining is presently fighting its way through the 1971 legislature. If enacted, it will ensure the reclamation of strip-mined land. When all this land is mined and then reclaimed, Montana will have developed a vast natural resource without destroying the environment—and that just doesn't happen everyday.

. . . The State Department of Health is presently enforcing the Clean Air Act of 1967. Benjamin Wake, director of the Air Pollution Control Division, feels confident that all major air polluters, with the possible exception of slash burning and other open burning, will find themselves in compliance with the Clean Air Act by June 30, 1973.

. . . The Stream Preservation Act of 1963 has already been very instrumental in preserving much of our free-flowing environment. Of special interest is the area of highway construction. Before this act, the science of economics almost completely dominated the minds of people planning our new highways. Today the environment pulls considerable weight in these plans.

. . . The Wild and Scenic Rivers Act of 1968 promises to give special protection to many of our famous rivers and the scenery which lines them. A designated wild and scenic river will provide for all time an environment filled with outstanding scenic, recreational, geologic, fish and wildlife, historic and/or cultural values.

. . . An ever-growing State Parks System maintains 29,368 acres of Montana's finest environment specifically for use by the outdoor recreationist. The system falls under the control of the Montana Fish and Game Commission and includes 105 fishing access sites, 32 recreation areas, 6 state parks, 9 state monuments, 5 recreation waterways and 1 recreation road.

. . . The commission also offers the fruits of 36 game management areas and 15 modern fish hatcheries and spawning stations to Montana sportsmen. Game management areas, extending in size up to the 27,000-acre, newly-purchased Beartooth Game Range, provide vital winter range and many other life essentials to Montana's game populations. Fish hatcheries and spawning stations raise and stock millions of fish, varying in size from one inch to 24 inches, in Montana's streams and lakes every year.

The preceding lists a few of the major developments on the environmental scene in Montana. Think about them and ask, "How will Montana fare in the long battle to save its environment?" The answer should be simple—"Better than most."

CONSIDER WHAT IS HAPPENING ELSEWHERE ON OUR GOOD EARTH AND THEN BE GLAD TO LIVE IN MONTANA ! ! !

OR MAN A LIVABLE ENVIRONMENT FOR WILDLIFE IS A QUALITY ENVIRONMENT FOR MAN

MAN AND HIS ENVIRONMENT

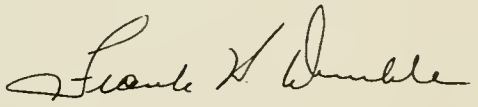
The populating of the North American continent from the time of Christopher Columbus to the present was based on the premise that man had to conquer the wilderness and control the forces of nature. During this era, quite frequently the national heroes and industrial leaders were those who could lay their hands on the biggest share of our natural resources and exploit them at a profit. Throughout the history of our country, there were always men of vision who warned and cautioned against this exploitation but for the most part their advice was seldom heeded. The forces they opposed or questioned were always sufficient to prevent meaningful conservation. These forces, some of which are very much with us today, were always able to prevail until the people became concerned and aroused. The first good example of this was during the era of Teddy Roosevelt when he made conservation of natural resources a national concern. This concern generated the first widespread conservation movement on the North American continent and resulted in an entirely new attitude toward the harvesting of natural resources.

Many good things happened for fish and wildlife during those years and programs fashioned during that era met the needs of those times. By and large, it was a time when protection was needed for natural resources such as fish and wildlife and, consequently, many programs were designed that protected fish and wildlife from excessive harvest by man. These programs were successful beyond the wildest dreams of their founders. They were successful to the point that today it is practically universally accepted that the harvest of fish and game must be regulated to protect the animals involved. With the public acceptance of this approach, we have observed an increase in many of the fish and game species pursued in the early 1900's and still enjoyed today. In fact, some species are more abundant today than ever before. Conservationists and resource managers won a great victory because they took their message to the people, sold it and gained widespread public support.

Today, the fish and wildlife resource passed on to us by those conservationists faces another and perhaps greater threat. Today's threat comes in the form of environmental pollution and habitat destruction. This crisis is unlike the earlier threat in two ways. First, it is not always a direct threat to individual animals; therefore, it cannot be met through restricted harvest. Second, if it is not met with new and imaginative programs, it will ultimately affect all animal life on earth including man himself.

Like you and me, wildlife needs a place to live. Each species has its particular requirements for feeding areas, hiding areas and breeding areas. If these needs are not met, it matters little if game falls victim to a coyote, skunk, wolf or your gun. The important fact is that without habitat, fish and wildlife are on the way out. This habitat in many cases can probably be converted to some other profitable venture if fish and wildlife are written off.

It is obvious that we are once again at a point of crisis in our effort to preserve North America's wildlife heritage. While we cannot fall back on the same programs that preserved this resource before, we can copy the technique that made it work. This technique, of course, is involving the people in a rebirth of the conservation movement. The spark is alive in a vast majority of the population but it must be fanned into a real flame. Involvement of the people, and that means all the people — not just hunters and fishermen — should be easier this time since the problems threatening wildlife today, if not solved, will threaten man tomorrow.



Frank H. Dunkle

A LIVABLE ENVIRONMENT FOR WILDLIFE IS A QUALITY ENVIRONMENT FOR MAN

MONTANA
FISH AND GAME DEPARTMENT
HELENA, MONTANA 59601
Address Correction Requested

The mountain goat's winter environment is seldom intruded upon.